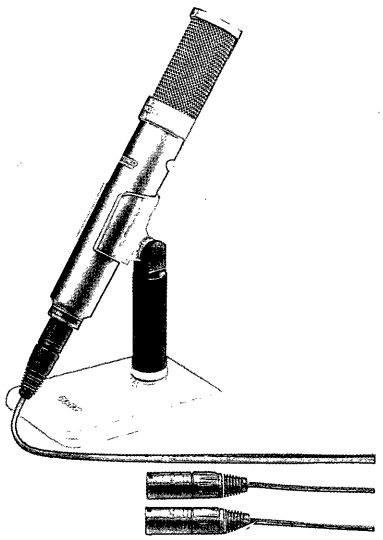
ECM-999/999PR

SERVICE MANUAL



US Model
Canadian Model
AEP Model
E Model
ECM-999

US Model
E Model
ECM-999PR

SPECIFICATIONS

General

Type	One-point stereo(employing the Mid-Side system), electret condenser microphone(with back-electret condenser capsules)
Microphone output connector	Cannon XLR-5-12C type (Pin connection: 1.Shield 2.L ch.hot 3.L ch.cold 4.R ch.hot 5.R ch. cold)
Microphone cord	Parallel two core shielded, OFC(Oxgen free copper) With Cannon type connector Length: Approx. 5 m
Battery	R6 (size AA) battery
Dimensions	40 x 246 mm (Outside diameter x length) (1 5/8 x 9 3/4 inches)
Mass	Approx. 385 g (13.5 oz)(including battery)
Supplied accessories	Wind screen (1) Microphone holder (1)(PF1/2 screw) Microphone cord (1) Adapting cord OFC(Oxygen free copper) Length: Approx. 50 cm (2) (ECM-999 only) Microphone stand screw adapter SAD-35 (1), SAD-34 (1) Carrying case (1) Operating Instructions (1)

Performance

Frequency response	20 – 20,000 Hz (See the illustration A.)
Directivity	Mid-Side stereo system Directive angle : 0° to 150° continuously variable (See the illustration B.)
Output impedance	480 ohms ±20%, balanced
Sensitivity(directive angle 120°)	Open circuit output voltage level*1 : –48 ±3dB Effective output level*2 : –50.8 ±3dBm Difference between L and R channel sensitivity: Less than 3dB *1 0dB = 1V/Pa, 1,000Hz (1Pa = 10μ bar = 94dBSPL) *2 0dBm = 1mW/Pa, 1,000Hz
Power requirements	Recommended load impedance : More than 3 kilohms Normal operating voltage :1.5 V, R6 (size AA) battery Minimum operating voltage : Approx. 1 V Battery life : Approx. 80 hours with a Sony R6P (size AA) battery
Noise level	Signal-to-noise ratio : More than 68 dB(1,000 Hz, 1Pa) Inherent noise (Converted to the equivalent input sound level)*3 : Less than 26 dBSPL Wind noise (With wind screen)*4 : Less than 50 dBSPL Induction noise from external magnetic field*5 : Less than 10 dBSPL *3 0 dBSPL = 2 x 10^{-5}Pa *4 Wind noise is the value measured by applying a wind velocity of 2m/s (6.6 ft/s) from all directions to the microphone. The mean value is taken and converted to the equivalent input sound level. *5 The external magnetic field induction noise is measured with the microphone placed in an alternating magnetic field of 50 Hz, 1 x 10^{-7} T. The maximum noise value is taken and then converted to the equivalent input sound level.
Maximum sound pressure input level	More than 130 dBSPL (at 1,000 Hz, 1% distortion)
Dynamic range	More than 104 dB
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	– 20 °C to +60 °C (–4 °F to +140 °F)

Optional accessories

Plug adaptor	PC-201M (Miniplug ↔ Phone jack) PC-58S (Stereo miniplug ↔ Phone jack x 2)

Design and specifications are subject to change without notice.

Features

- The Mid-Side system* is employed to give excellent sound image and faithful stereo sound reproduction with less "hole in the middle".
- The directive angle between the left and right channels can be changed progressively from 0° (monaural) to 150° according to the sound source.
- Electret condenser microphone with back-electret condenser capsules permits good sound pick up.

*** Mid-Side system**
The sum of signals of the mid microphone unit (uni-directional) and side microphone unit (bi-directional) and the difference between them are used for R and L channels respectively.

使用時は添付資料も参照のこと
Refer to the additional documents

ELECTRET CONDENSER STEREO MICROPHONE

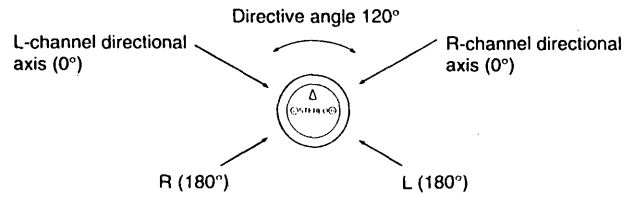
SONY®

Frequency Response

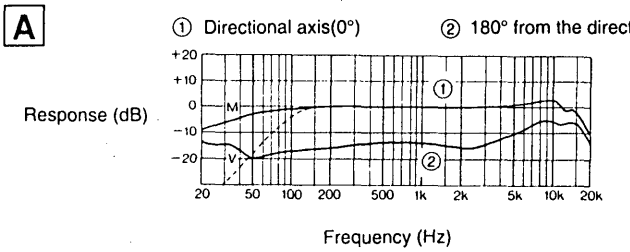
See illustration [A].

Directivity

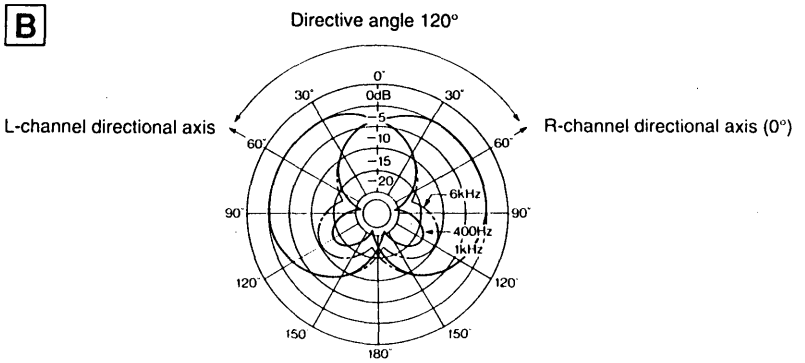
See illistration [B].



A



B



Battery Installation

When to replace the battery

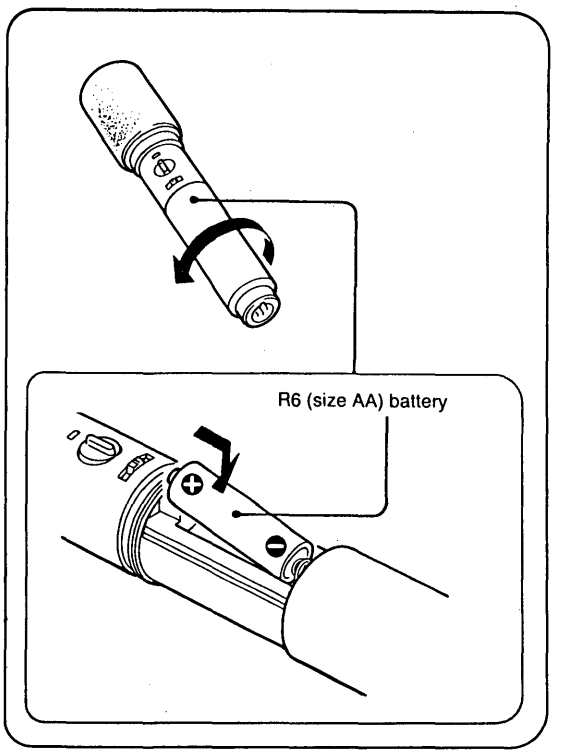
When the power is turned on, the battery check indicator lights momentarily. When the battery becomes weak, the indicator remains dimly lit or does not light at all. In this case, replace the battery with a new one.

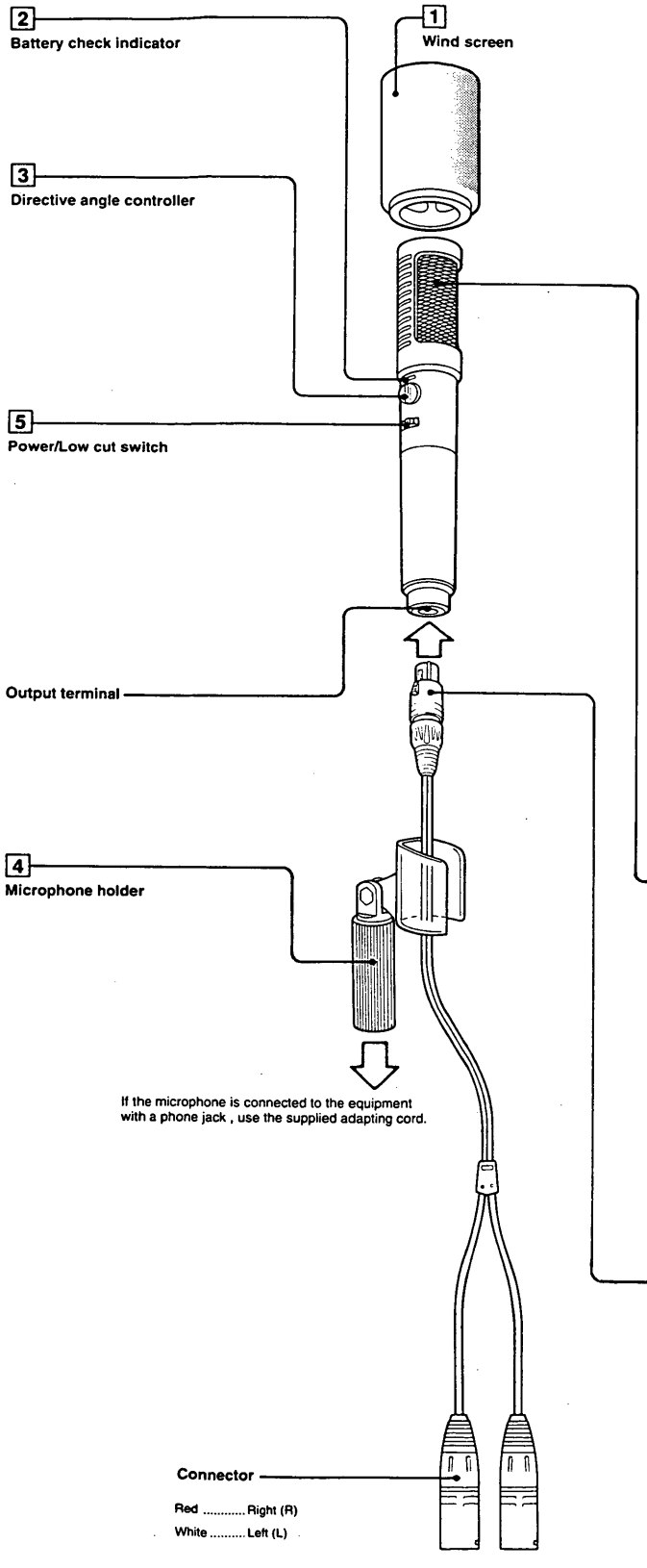
Sony R6P (size AA) battery gives continuous operation of the microphone for about 80 hours.

Notes on battery

To avoid damage to the unit caused by battery leakage and corrosion;

- Install the battery with correct polarity.
- Do not try to recharge batteries.
- Remove the battery if the microphone is not to be used for a long period of time.
  In case of battery leakage, wipe off any deposit in the battery compartment before installing a new battery.





Parts Identifications and Uses

1 Wind screen

Attach to reduce wind or breathing noise.

2 Battery check indicator

When the power/low cut switch is set to M from OFF, the indicator lights momentarily. This indicates that the battery is usable.

3 Directive angle controller

Selects the directive angle between the left and right channels in accordance with sound source or sound level.

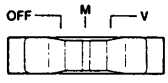
Sound sources		Location of a microphone
To record with a monaural tape recorder	0°	—
To pick up a narrower sound source e.g. • An instrumental solo • Bird and insect song	90° \ 120°	Close to the sound source
To pick up a wider sound source e.g. • An orchestra, chorus • A moving train, airplane, motor car race • Speeches at a conference • Natural sounds, urban sounds,etc.	120° \ 150°	Rather farther away from the sound source

While picking up sounds from wider (narrower) sound source, avoid moving the microphone itself, so as to maintain the original sound balance.

4 Microphone holder

Install to the optional microphone stand.

5 Power/Low cut switch



OFF	To turn off the power
M	To pick up sounds such as musical instruments and natural sounds away from the sound source
V	To pick up a human voice more clearly To reduce low range noise such as wind

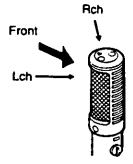
6 Adapting cord

If the microphone is connected to the equipment with a phone jack , use the supplied adapting cord.

Microphone unit

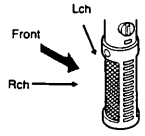
How to direct the microphone

Direct the microphone to the sound source vertically.



Note

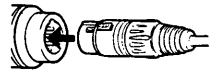
When the microhone is used upside down, L and R outputs are reversed.



Connection

To attach

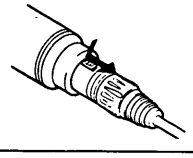
1 Align the connector with the output terminal of the microphone.



2 Insert the connector until a click is heard.

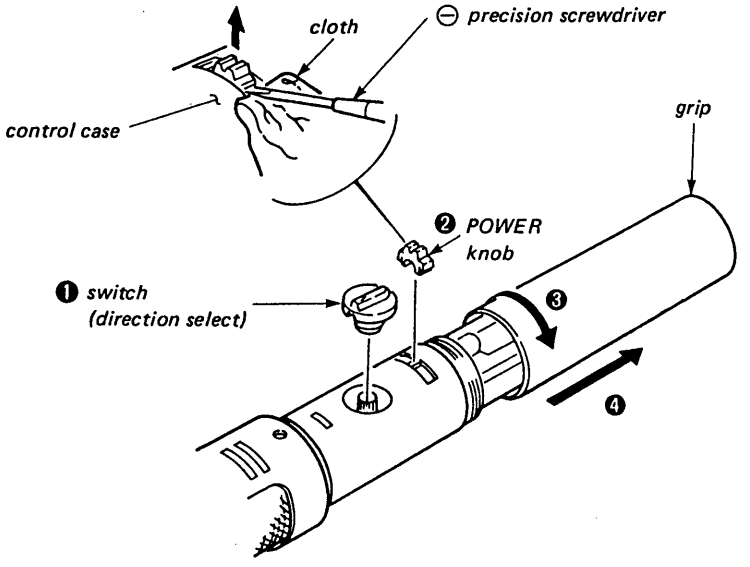
To detach

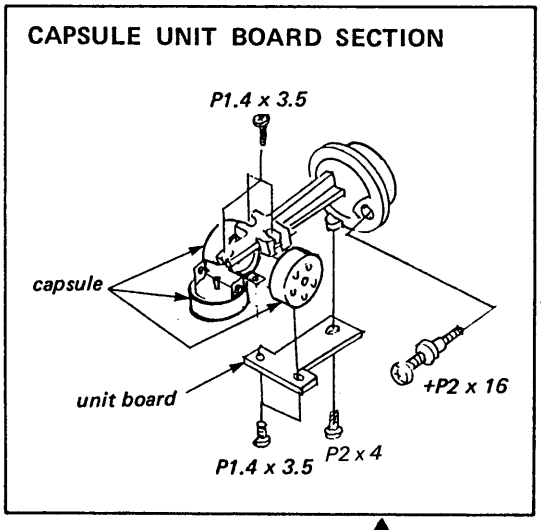
While pressing the projection, pull out the connector.

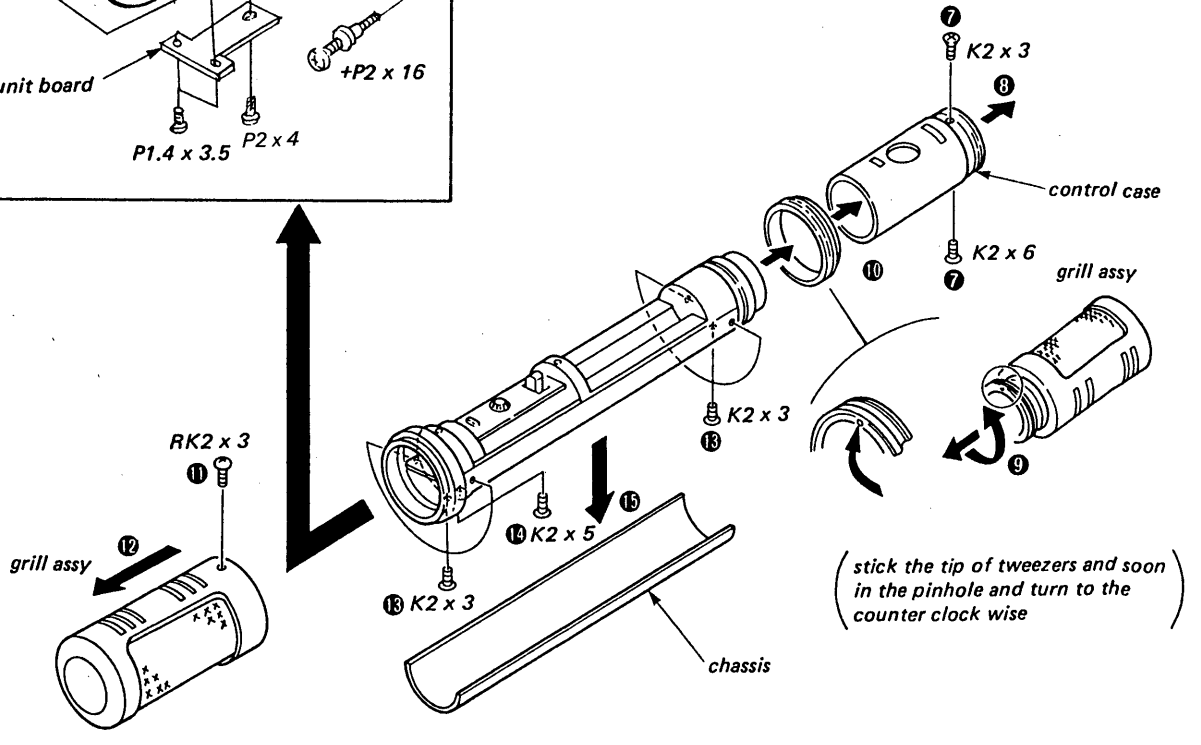


DISASSEMBLY

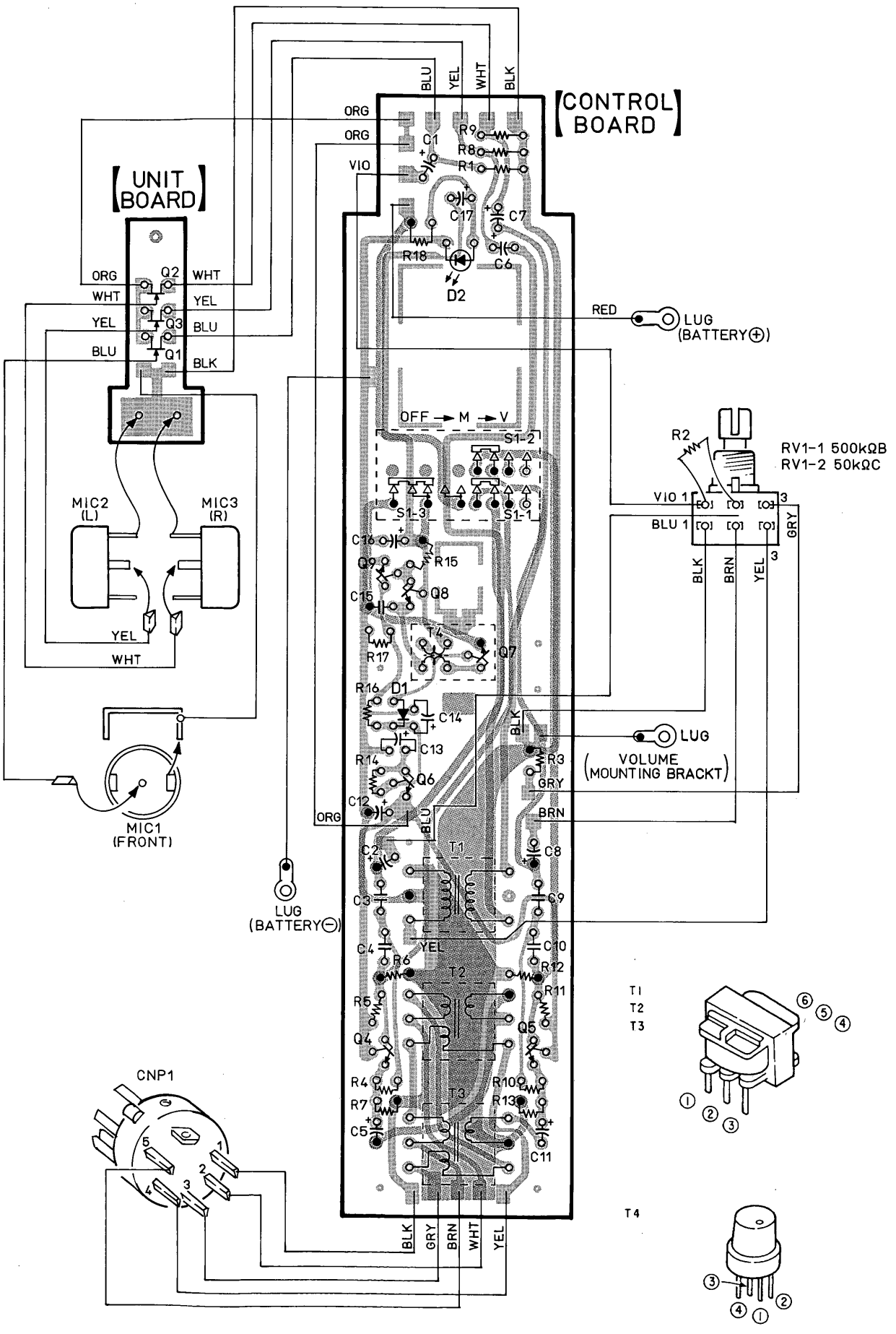
Note: Follow the disassembly procedure in the numerical order given.



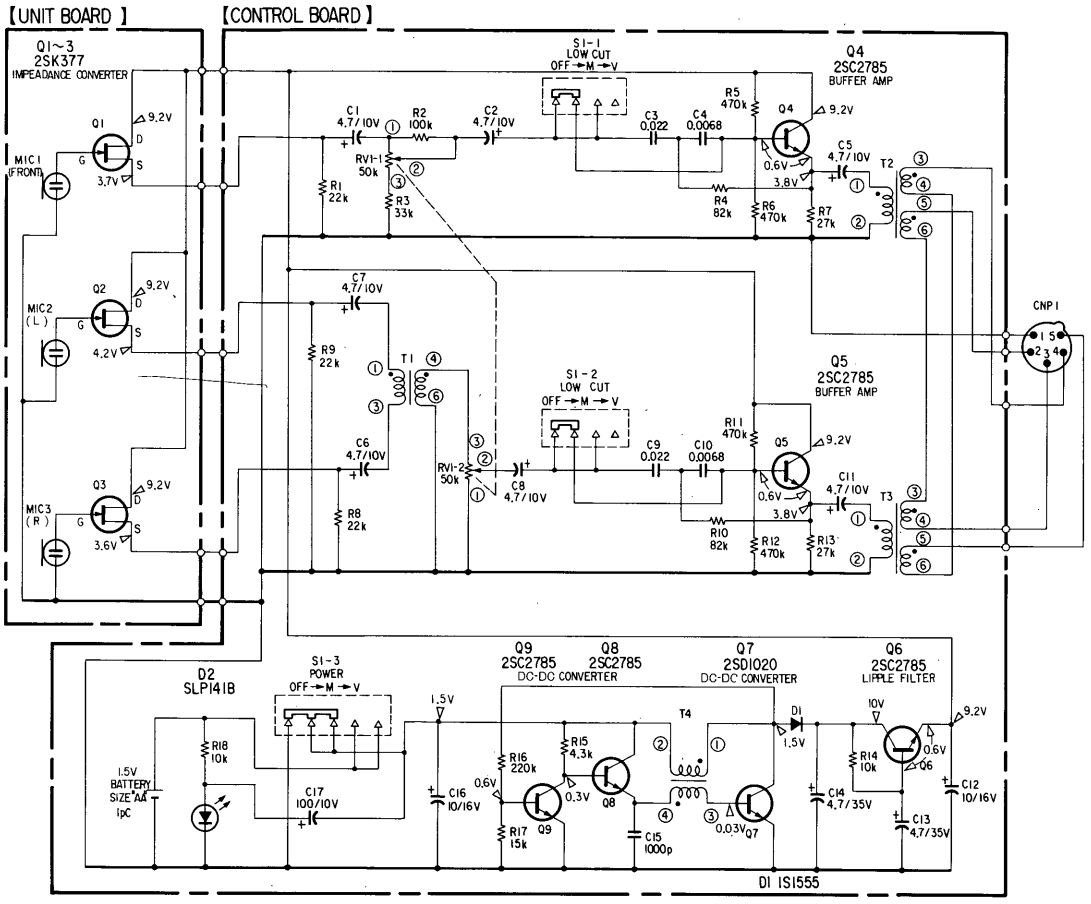




PRINTED WIRING BOARDS



SCHEMATIC DIAGRAM



Note on Printed Wiring Board:

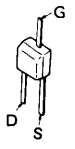
- ○—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- ● : Through hole.
- ▒▒ : Pattern on the side which is seen.
- ○ ▒▒ : Pattern of the rear side.

Note on Schematic Diagram:

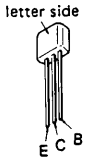
- All capacitors are in μF unless otherwise noted. pF: $\mu\mu$F. 50WV or less are not indicated except for electrolytics. and tantalums.
- All resistors are in ohms, 1/4W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- ○ Voltages are dc with respect to ground unless otherwise noted.

● Semiconductor Lead Layouts

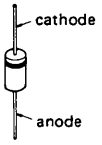
2SK377-K



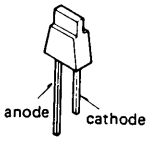
2SC1020H
2SC2785



1S1555



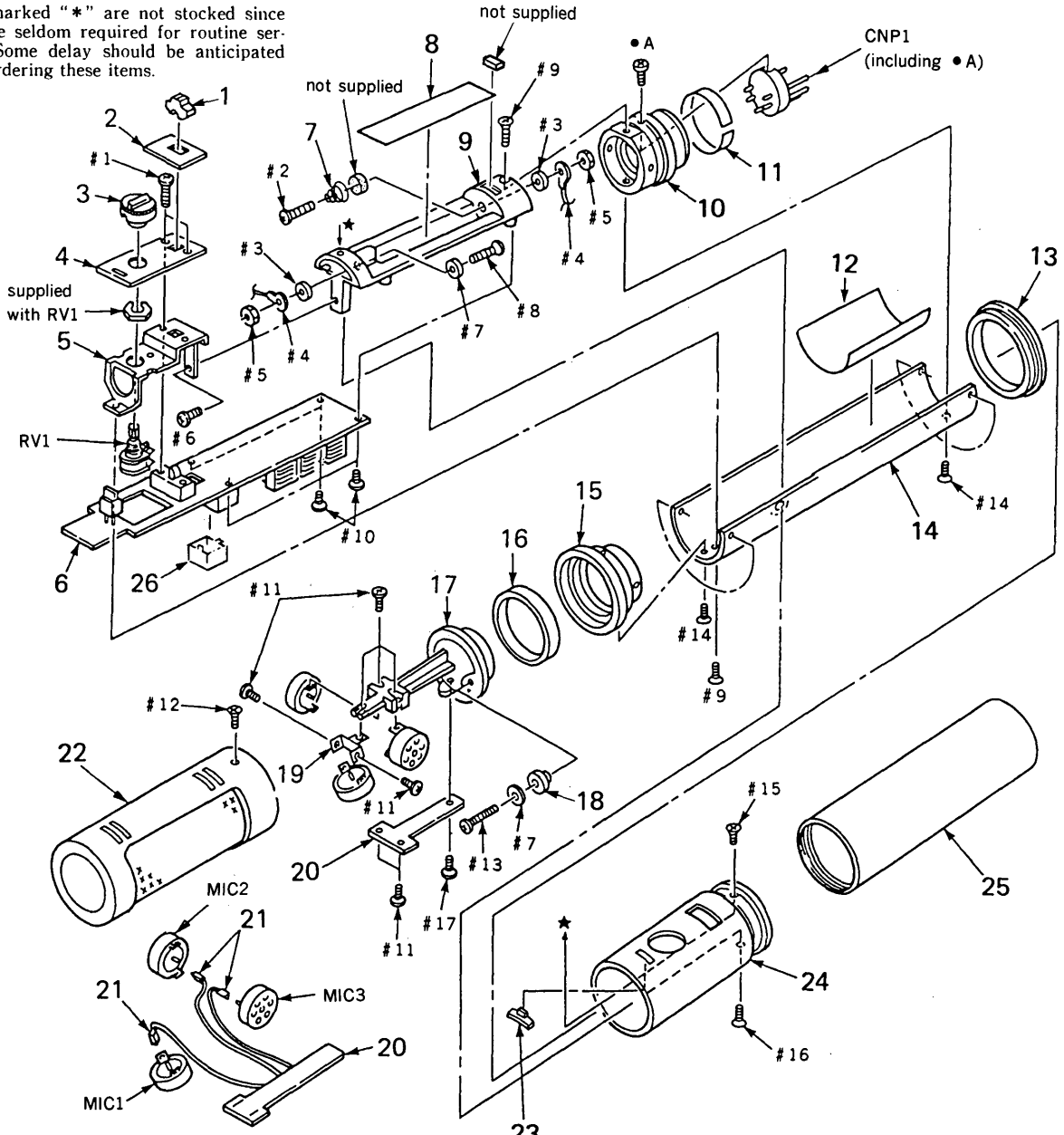
SLP141B



EXPLODED VIEW AND PARTS LIST

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.



Ref. No.	Part No.	Description	Remark
1	2-259-709-11	KNOB, SWITCH	
2	5-259-725-00	COVER, SWITCH	
3	2-529-846-11	KNOB, VOLUME	
* 4	2-529-742-01	PLATE, LED	
* 5	2-529-843-01	BRACKET, VOLUME	
* 6	1-622-146-11	CONTROL BOARD	
7	2-527-097-00	SPRING	
8	2-523-710-00	LABEL, BATTERY	
9	5-529-731-00	PLATE, BATTERY	
10	5-529-839-01	SLEEVE, CONNECTOR	
11	2-543-315-01	LABEL, MODEL NUMBER (ECM-999PR)	
11	2-543-133-01	LABEL, MODEL NUMBER (ECM-999)	
* 12	2-529-847-01	PLATE, SHIELD	
* 13	2-529-837-11	COVER, CASE	
* 14	2-529-841-01	CHASSIS	
* 15	2-529-836-01	JOINT, CASE	

Ref. No.	Part No.	Description	Remark
16	2-529-728-00	CUSHION (A), BASE	
17	2-529-732-00	BASE, CAPSULE	
18	2-529-729-00	CUSHION (B), BASE	
* 19	2-529-845-01	BRACKET, CAPSULE	
* 20	1-622-147-11	UNIT BOARD	
21	2-253-713-00	TERMINAL	
22	X-2542-069-1	GRILLE ASSY	
23	2-529-706-00	COVER, LED	
24	2-529-838-01	CASE, CONTROL	
25	2-543-132-01	GRIP	
* 26	2-529-844-01	CASE, SHIELD	
* CNP1	1-560-490-00	PIN, CONNESTOR 5P	
MIC1, MIC2, MIC3	X-2542-076-1	CAPSULE KIT	
RV1	1-226-904-00	RES, VAR, CARBON 50K/50K	

CONTROL

ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA . . : μA. . uPA. . : μPA. .
  uPB. . : μPB. . uPC. . : μPC. . uPD. . : μPD. .
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	1-622-146-11	CONTROL BOARD			
		**********			
		< CAPACITOR >			
C1	1-131-375-00	TANTALUM	4.7uF	10%	10V
C2	1-131-375-00	TANTALUM	4.7uF	10%	10V
C3	1-130-487-00	MYLAR	0.022uF	5%	50V
C4	1-130-481-00	MYLAR	0.0068uF	5%	50V
C5	1-131-375-00	TANTALUM	4.7uF	10%	10V
C6	1-131-375-11	TANTALUM	4.7uF	10%	10V
C7	1-131-375-00	TANTALUM	4.7uF	10%	10V
C8	1-131-375-00	TANTALUM	4.7uF	10%	10V
C9	1-130-487-00	MYLAR	0.022uF	5%	50V
C10	1-130-481-00	MYLAR	0.0068uF	5%	50V
C11	1-131-375-00	TANTALUM	4.7uF	10%	10V
C12	1-131-353-00	TANTALUM	10uF	20%	35V
C13	1-126-163-11	ELECT	4.7uF	20%	50V
C14	1-162-163-11	ELECT	4.7uF	20%	50V
C15	1-161-039-00	CERAMIC	0.001uF	10%	50V
C16	1-131-353-00	CERAMIC	10uF	20%	35V
C17	1-124-584-00	ELECT	100uF	20%	10V
		< DIODE >			
D1	8-719-911-19	DIODE	1SS119		
D2	8-719-938-45	DIODE	SLP141B-51		
		< TRANSISTOR >			
Q4	8-729-119-78	TRANSISTOR	2SC2785-HFE		
Q5	8-729-119-78	TRANSISTOR	2SC2785-HFE		
Q6	8-729-119-78	TRANSISTOR	2SC2785-HFE		
Q7	8-729-102-14	TRANSISTOR	2SD1021		
Q8	8-729-119-78	TRANSISTOR	2SC2785-HFE		
Q9	8-729-119-78	TRANSISTOR	2SC2785-HFE		

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R1	1-249-433-11	CARBON	22K	5%	1/4W
R2	1-249-441-11	CARBON	100K	5%	1/4W
R3	1-249-435-11	CARBON	33K	5%	1/4W
R4	1-249-440-11	CARBON	82K	5%	1/4W
R5	1-247-895-00	CARBON	470K	5%	1/4W
R6	1-247-895-00	CARBON	470K	5%	1/4W
R7	1-249-434-11	CARBON	27K	5%	1/4W
R8	1-249-433-11	CARBON	22K	5%	1/4W
R9	1-249-433-11	CARBON	22K	5%	1/4W
R10	1-249-440-11	CARBON	82K	5%	1/4W
R11	1-247-895-00	CARBON	470K	5%	1/4W
R12	1-247-895-00	CARBON	470K	5%	1/4W
R13	1-249-434-11	CARBON	27K	5%	1/4W
R14	1-247-855-11	CARBON	10K	5%	1/4W
R15	1-247-846-11	CARBON	4.3K	5%	1/4W
R16	1-247-887-00	CARBON	220K	5%	1/4W
R17	1-249-431-11	CARBON	15K	5%	1/4W
R18	1-247-855-11	CARBON	10K	5%	1/4W
		< SWITCH >			
S1	1-553-414-21	SWITCH, SLIDE (POWER/LOW CUT)			
		< TRANSFORMER >			
T1	1-427-582-11	TRANSFORMER, OUTPUT			
T2	1-427-583-11	TRANSFORMER, OUTPUT			
T3	1-427-583-11	TRANSFORMER, OUTPUT			
T4	1-448-874-11	TRANSFORMER, DC-DC CONVERTER			
**********					

Ref. No.	Part No.	Description	Remark
*	1-622-147-11	UNIT BOARD	
		**********	
	2-523-713-00	TERMINAL	
	7-623-505-01	LUG, 2	
		< TRANSISTOR >	
Q1	8-729-824-20	TRANSISTOR 2SK377-K1	
Q2	8-729-824-20	TRANSISTOR 2SK377-K1	
Q3	8-729-824-20	TRANSISTOR 2SK377-K1	
		MISCELLANEOUS	
		**********	
CNP1	1-560-490-00	PIN, CONNECTOR 5P	
MIC1, MIC2, MIC3	X-2542-076-1	CAPSULE KIT	
RV1	1-226-904-00	RES, VAR, CARBON 50K/50K	

****

HARDWARE LIST

****

#1	7-627-552-47	SCREW, PRECISION +P 1.7X4
#2	7-621-255-42	SCREW +P 2X6
#3	7-623-420-07	LW 2, TYPE B
#4	7-623-505-01	LUG, 2
#5	7-622-205-05	NUT M2 TYPE2
#6	7-685-102-21	SCREW +P 2X4 TYPE2 SLIT
#7	7-688-001-01	W 2. MIDDLE
#8	7-621-255-72	SCREW +P 2X12
#9	7-627-452-38	SCREW, PRECICION +K 2X5
#10	7-621-255-15	SCREW +P 2X3
#11	7-627-551-67	SCREW, PRECISION +P 1.4X3.5
#12	7-627-452-28	SCREW, PRECISION +RK 2X4
#13	7-621-256-05	SCREW +P 2X16
#14	7-627-452-17	SCREW, PRECISION +K 2X3
#15	7-627-452-18	SCREW, PRECICION +K 2X3
#16	7-627-452-58	SCREW +K 2X6 TYPE1
#17	7-685-102-21	SCREW +P 2X4 TYPE2 SLIT

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-696-451-11	CABLE, MICROPHINE (2 CORE)	
	1-696-566-11	CORD, MICROPHONE (DIA. 5) (2 CORE) (ECM-999)	
	2-100-951-04	ADAPTER, SCREW, STAND (SAD-34)	
	2-100-952-00	ADAPTER, SCREW, STAND (SAD-35)	
*	2-543-210-01	INDIVIDUAL CARTON (ECM-999)	
*	2-543-335-01	INDIVIDUAL CARTON (ECM-999PR)	
	3-755-503-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, GERMAN, DUTCH, SWEDISH, ITALIAN, PORTUGUESE)	
	A-4580-007-A	SCREEN ASSY, WINDOW	
	X-2529-802-1	HOLDER ASSY, MICROPHONE	

9-957-493-12

Sony Corporation
Consumer A & V Products Company
Personal A & V Products Div.

English
94J04056-1
Printed in Japan

Published by Home A & V Products Div.
Quality Engineering Dept.

ECM-999/999PR

SONY®
SERVICE MANUAL

US Model
Canadian Model
AEP Model
E Model
ECM-999

US Model
E Model
ECM-999PR

SUPPLEMENT-1

File this supplement with the service manual.

Subject: CORRECTION
CHANGE THE PC BOARD

(ENG-95026)

1. CORRECTION

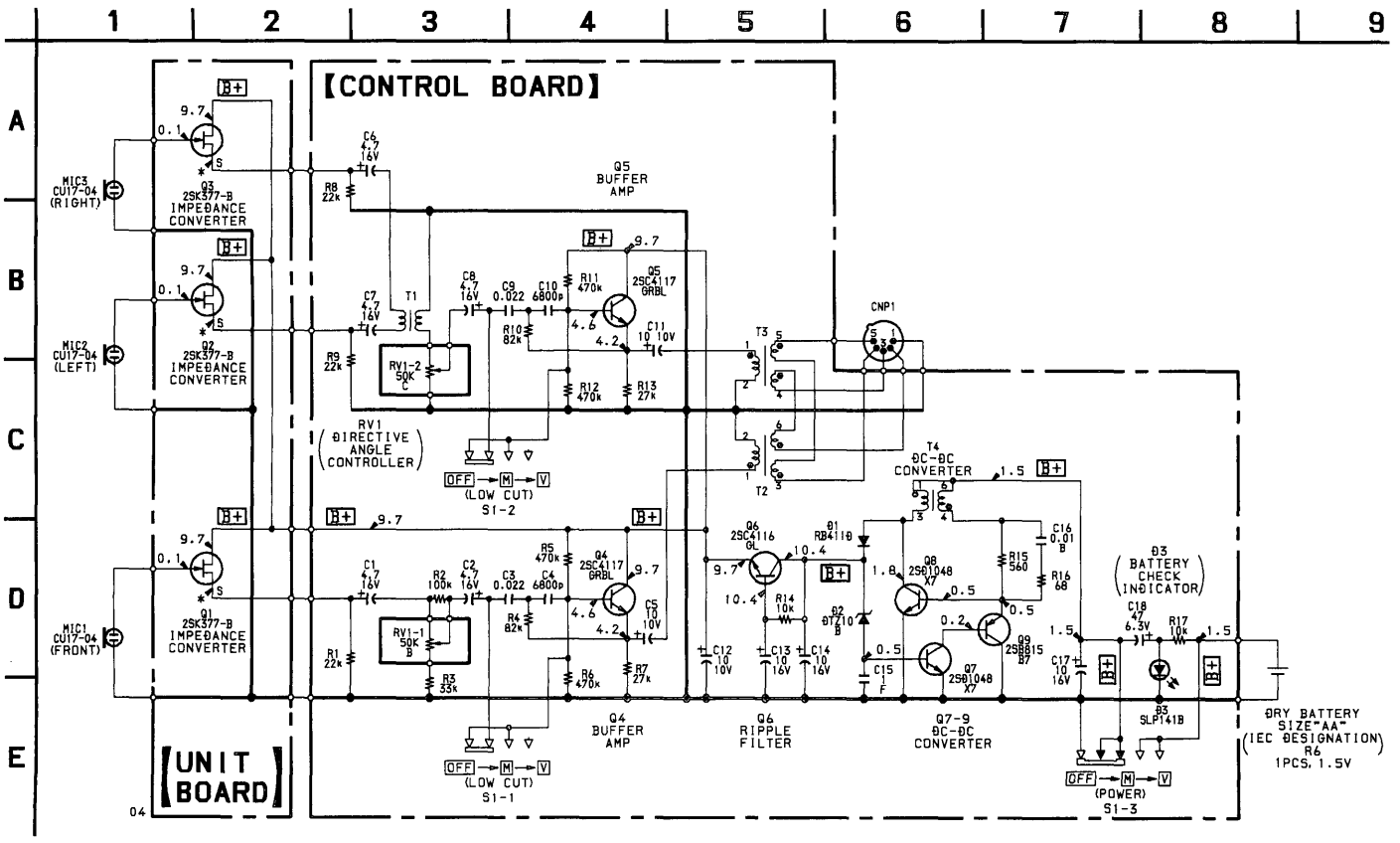
☛ : indicates corrected portion.

Page	INCORRECT				CORRECT		
	Ref. No.	Part No.	Description	Remark	Part No.	Description	Remark
	* 4	2-529-742-01	PLATE, LED		* 2-529-842-01 ☛	PLATE, LED	
7	9	5-529-731-00	PLATE, BATTERY		2-529-731-00 ☛	PLATE, BATTERY	
	10	5-529-839-01	SLEEVE, CONNECTOR		2-529-839-01 ☛	SLEEVE, CONNECTOR	

2. EXPLODED VIEW

Page	Former Type				New Type		
	Ref. No.	Part No.	Description	Remark	Part No.	Description	Remark
7	* 6	1-622-146-11	CONTROL BOARD		* 1-658-256-11	CONTROL BOARD	
	* 26	2-529-844-01	CASE, SHIELD		————		

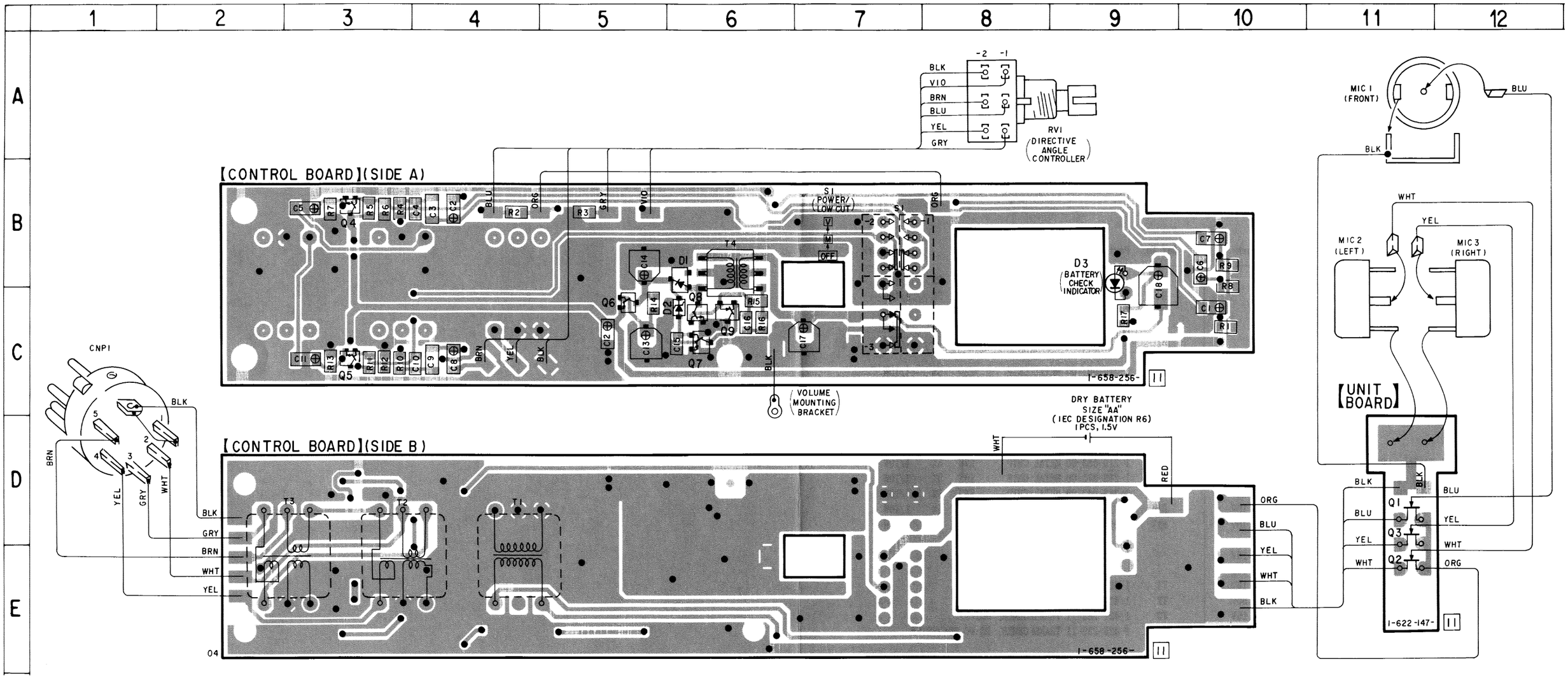
3. SCHEMATIC DIAGRAM



Note :

- All capacitors are in μF unless otherwise noted. pF : $\mu\mu$F 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ : B+ Line
- Power voltage is dc 1.5V and fed with regulated dc power supply from battery terminal.
- Voltage is dc with respect to ground under no-signal conditions.
- no mark: POWER : M
  * : Impossible measurement point
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

4. PRINTED WIRING BOARDS



Note :

- ——— : parts extracted from the conductor side.
- ● : Through hole.
- ▨ : Pattern on the side which is seen.
  (The other layer's patterns are not indicated.)

● Semiconductor Location

Ref. No.	Location
D1	B-6
D2	C-6
D3	B-9
Q1	D-11
Q2	E-11
Q3	D-11
Q4	B-3
Q5	C-3
Q6	C-5
Q7	C-6
Q8	C-6
Q9	C-6

CONTROL UNIT

5. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

Ref.No.	Part No.	Description			Remark
*	1-658-256-11	CONTROL BOARD			
		**********			
		< CAPACITOR >			
C1	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C2	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C3	1-104-555-11	FILM CHIP	0.022uF	5%	16V
C4	1-104-549-11	FILM CHIP	0.0068uF	5%	16V
C5	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C6-8					
	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C9	1-104-555-11	FILM CHIP	0.022uF	5%	16V
C10	1-104-549-11	FILM CHIP	0.0068uF	5%	16V
C11	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C12	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C13	1-124-779-00	ELECT CHIP	10uF	20%	16V
C14	1-124-779-00	ELECT CHIP	10uF	20%	16V
C15	1-164-346-11	CERAMIC CHIP	1uF		16V
C16	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C17	1-124-779-00	ELECT CHIP	10uF	20%	16V
C18	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
		< DIODE >			
D1	8-719-975-40	DIODE RB411D			
D2	8-719-977-28	DIODE DTZ10B			
D3	8-719-938-45	LED SLP141B-51			(BATTERY CHECK INDICATOR)
		< TRANSISTOR >			
Q4	8-729-013-33	TRANSISTOR	2SC4117-GRBL-TE85L		
Q5	8-729-013-33	TRANSISTOR	2SC4117-GRBL-TE85L		
Q6	8-729-231-74	TRANSISTOR	2SC4116-GL		
Q7	8-729-800-37	TRANSISTOR	2SD1048-X7		
Q8	8-729-800-37	TRANSISTOR	2SD1048-X7		
Q9	8-729-800-73	TRANSISTOR	2SB815B7-TA		
		< RESISTOR >			
R1	1-216-081-00	METAL CHIP	22K	5%	1/10W
R2	1-216-097-00	METAL CHIP	100K	5%	1/10W
R3	1-216-085-00	METAL CHIP	33K	5%	1/10W
R4	1-216-095-00	METAL CHIP	82K	5%	1/10W
R5	1-216-113-00	METAL CHIP	470K	5%	1/10W
R6	1-216-113-00	METAL CHIP	470K	5%	1/10W
R7	1-216-083-00	METAL CHIP	27K	5%	1/10W
R8	1-216-081-00	METAL CHIP	22K	5%	1/10W
R9	1-216-081-00	METAL CHIP	22K	5%	1/10W
R10	1-216-095-00	METAL CHIP	82K	5%	1/10W
R11	1-216-113-00	METAL CHIP	470K	5%	1/10W
R12	1-216-113-00	METAL CHIP	470K	5%	1/10W
R13	1-216-083-00	METAL CHIP	27K	5%	1/10W
R14	1-216-073-00	METAL CHIP	10K	5%	1/10W
R15	1-216-043-00	METAL CHIP	560	5%	1/10W
R16	1-216-021-00	METAL CHIP	68	5%	1/10W
R17	1-216-073-00	METAL CHIP	10K	5%	1/10W
		< TRANSFORMER >			
T1	1-427-582-11	TRANSFORMER, OUTPUT			
T2	1-427-583-11	TRANSFORMER, OUTPUT			
T3	1-427-583-11	TRANSFORMER, OUTPUT			
T4	1-429-239-11	TRANSFORMER, DC-DC CONVERTER			
		< SWITCH >			
S1	1-553-414-21	SWITCH, SLIDE (POWER/LOW CUT)			
**********					
*	1-622-147-11	UNIT BOARD			
		**********			
	2-523-713-00	TERMINAL			
	7-623-505-01	LUG, 2			
		< TRANSISTOR >			
Q1	8-729-031-76	TRANSISTOR	2SK377-B		
Q2	8-729-031-76	TRANSISTOR	2SK377-B		
Q3	8-729-031-76	TRANSISTOR	2SK377-B		
**********					

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS	
		**********	
* CNP1	1-560-490-00	PIN, CONNECTOR 5P	
MIC1-3			
	X-2542-076-1	CAPSULE KIT	
RV1	1-226-904-00	RES, VAR, CARBON 50K/50K (DIRECTIVE ANGLE CONTROLLER)	

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